MONTHLY NOTICES

OF THE

ROYAL ASTRONOMICAL SOCIETY.

A. A. COMMON, LL.D., F.R.S., President, in the Chair.

James Cavan, M.A., Eaton Mascott Hall, Shrewsbury, and
Thomas Edward Knightley, Clive House, Tulse Hill,
were balloted for and duly elected Fellows of the Society.

The following candidates were proposed for election as Fellows
of the Society, the names of the proposers from personal know-
ledge being appended :—

William Banks, Optician, 30 Corporation Street, Bolton,
    Lancashire (proposed by J. R. Bridson) ;
Henry Frank Griffiths, Sherwood Villa, Angles Road,
    Streatham, S.W. (proposed by Rev. W. R. Waugh) ; and
Alfred Ernest Young, Assoc. M. Inst. C.E., Assistant-
    Surveyor and Chief Computer, Trigonometrical Survey of
    Perak, Taiping, Perak, Straits Settlements (proposed by
    James Simms).

One hundred and sixteen presents were announced as having
been received since the last meeting, including, amongst
others :—

J. Bauschinger, Untersuchungen über die astronomische Re-
fraction &c., presented by the author ; A. Cayley, collected
mathematical papers, vol. ix., presented by the Cambridge Uni-
versity Press ; Galileo, Opere, Edizione nazionale, presented by
the Italian Government ; Lick Observatory Contributions, Nos.
4 and 5, presented by the Observatory ; nine enlargements from

z

negatives of the Moon by MM. Lœwy and Puiseux, presented by
Dr. Weinek ; photographs of the lunar eclipse 1896 February 28,
presented by G. J. Newbegin.

On the Systematic Errors of Measures on Photographic Plates.
By H. H. Turner, M.A., B.Sc., Savilian Professor.

(1) In the January number of the *Monthly Notices* the
Astronomer Royal and Mr. Dyson gave an account of the work
done at the Royal Observatory, Greenwich, in measuring and
reducing a number of plates for the Astrographic Catalogue.
The material thus available for the study of the accidental and
systematic errors of such measures is most valuable, for the
number of overlapping plates discussed brings out the power of
the photographic method, and also its limitations, in a very clear
manner.

(2) The present note is concerned with one section of the
paper only, viz., that headed "Systematic Error in the Deter-
mination of a." It is therein shown that when a S.E. corner of
one plate is compared with the N.W. corner of an overlapping
plate, the deduced value of the constant a is positive ; whereas
when a S.W. corner is compared with a N.E. corner, the value
of a is negative—a being one of the constants in a pair of linear
equations

$$x_2 - x_1 = ax_1 + by_1 + c$$

$$y_2 - y_1 = dx_1 + ey_1 + f$$

which represent the differences between the coordinates on the
two plates. Such a systematic error is cumulative, and prevents
the stepping from one plate to another with anything like
accuracy.

(3) The sources of such an error may be numerous—errors in
the réseau or the measuring scale, optical distortion, &c. It is
remarked in the paper that as yet no investigation of them has
been made. The object of the present note is to consider one
possible cause—viz. tilt of the plate. The error noted is small,
though it becomes serious by accumulation; and it is possible that
a slight want of perpendicularity of the plate to the line joining
the centre of the object-glass and the centre of the plate might
explain it in a manner developed in the sequel. I know that
particular care has been taken to have this adjustment made at
Greenwich, but the adjustments of a telescope cannot be examined
every day, and possibly this particular adjustment may have been
accidentally disturbed at some time. It is in any case advisable
to consider the effect of such a disturbance.

(4) It has been shown in previous papers that if the normal